

Econometric Modeling of Agricultural Exports and Economic Growth in Uzbekistan: An Empirical Study

Irtaza Nawaz

Department of Foreign Economic Activity, Tashkent State University of Oriental Studies, Uzbekistan. Irtaza.joiya@yahoo.com

Ruo Lyu

Department of Foreign Economic Activity, Tashkent State University of Oriental Studies, Uzbekistan. Dongliglassware003@126.com

Mehri Khasanovna Vokhidova

Department of Foreign Economic Activity, Tashkent State University of Oriental Studies, Uzbekistan. mehrivoxidova@gmail.com

Murtaza Nawaz

Manager Corporate Legal, The Islamia University of Bahawalpur, Pakistan. Murtaza.nawaz@iub.edu.pk

ABSTRACT

Empirical evidence is mixed while agricultural exports are an important source of growth for many developing countries. This study aims to examine the effect of agricultural export, governmental support and agricultural productivity on the growth of the economy of Uzbekistan. The research design adopted was quantitative and the data obtained were primary data from 300 respondents comprising farmers, exporters, agribusiness and policy stakeholders. Data were analyzed by SPSS descriptive statistics, reliability analysis (Cronbach's Alpha), Pearson correlation analysis and Multiple Regression analysis. It was specified that the econometric model is $EG = \beta_0 + \beta_1AE + \beta_2GS + \beta_3AP + \epsilon$. The reliability of the measurement scale was very good (Cronbach's Alpha was 0.914). Each of the three independent variables had a positive and significant impact on economic growth. Agricultural exports had the strongest impact ($\beta = 0.737$, $p < 0.001$), followed by government support ($\beta = 0.130$, $p = 0.001$) and agricultural productivity ($\beta = 0.094$, $p = 0.020$).

The model explained 78.8% of the variance in economic growth ($R^2 = 0.788$, $F = 367.251$, $p < 0.001$). The results are consistent with the export-led growth hypothesis. Along with government assistance and productivity gains, agricultural exports have the greatest potential to drive economic growth. The recommendations made are to improve access to export markets, improve institutional support, and technological adoption in agriculture.

Keywords: Econometric modeling; agricultural exports; economic growth; government support; agricultural productivity; export-led growth; Uzbekistan

1. Introduction

The quest for economic growth is a key goal in the agenda of every country, and a measure of the progress in the area of income, employment, and living standards (Armeanu et al., 2017). Agriculture in developing economies is often important, contributing significantly to gross domestic product (GDP), employment, and foreign exchange earnings (Osabohien et al., 2019). Especially agricultural exports act as a link with the outside world, providing foreign currency to import capital goods and advanced technologies (Oyetade & Adeyeye, 2021).

Despite the acknowledged relevance of agricultural exports, it has been found that their impact on the economic growth varies between positive and negative and is in some way context specific (Bakari & Mabrouki, 2017; Bakari & Tiba, 2022). Positive impacts have been observed in some studies, while weak or insignificant relationships have been detected in others, suggesting the need for solid and specific econometric studies (Mahmood & Munir, 2018). The export led growth (ELG) hypothesis states that export growth can stimulate economic growth through productivity growth, economies of scale and through foreign exchange earnings (Balassa, 1978). But, the contribution of agricultural exports as the source of growth is dependent on the government policies, infrastructure, and technological adoption (Grossman & Helpman, 1993; Krueger, 2000).

The case of Uzbekistan is interesting. About 32% of GDP is generated from agriculture and around 27% of the population are employed in agriculture. While the country has been looking for agricultural reforms and export diversification, the empirical connection between agricultural exports and economic growth has not

been carefully investigated with recent data and sophisticated econometric techniques. This study is an effort to fill the gap.

The main goal of this study is to investigate the impact of agricultural exports on economic growth through econometric modeling in addition to the impact of government support and agricultural productivity. The study answers the following research questions:

1. What is the relationship between agricultural exports and economic growth?
2. Do agricultural exports significantly influence economic growth?
3. What are the effects of government support and agricultural productivity on economic growth?

2. Literature Review

2.1 Theoretical Framework

The export-led growth hypothesis suggests that exporting encourages economic growth via higher production levels, greater efficiency and through exposure to foreign markets (Balassa, 1978; Feder, 1983). The central tenets of neoclassical growth theory are the importance of capital accumulation and technological advance (Solow, 1956), while endogenous growth theory focuses on innovation, human capital, and knowledge spillovers (Grossman & Helpman, 1993; Romer, 1990). These fit the context of the agricultural sector: exports can create foreign exchange, drive investment and technology transfer (ST) (Stern, 2019).

2.2 Empirical Evidence

On average, global studies find a positive link between agricultural export growth and growth. A panel data analysis by Thommandru et al. (2023) of 25 developing countries suggests that a 1% increase in agricultural exports leads to an increase in GDP growth of around 0.35%. This effect is magnified when export diversification and technology adoption are used, as reported by Murugesan (2019). But other studies indicate less or no effect, especially for primary commodity dependent economies of countries with price volatility (Adelakun et al., 2025).

Ridzuan et al. (2020) concluded that agricultural exports positively impact growth in Central Asian countries, with the elasticity being 0.40-0.45 for Uzbekistan and Kazakhstan, and 0.20-0.25 for Kyrgyzstan and Tajikistan, owing to

infrastructure constraints. A time-series study on the ARDL models was conducted on the relationship between agricultural exports and GDP in the case of Uzbekistan in the period 2000–2022, which revealed the long-run relationship coefficient of 0.42 (El Weriemmi & Bakari, 2024).

Government assistance such as subsidies, infrastructure, and trade facilitation has been found to have a positive impact on agricultural export performance (Saberri & Hamdan, 2019; Songling et al., 2018). Better agricultural productivity, resulting from the introduction of modern technology and inputs, is also a positive factor for growth (Güzel & Akin, 2021; Maiga, 2024).

2.3 Research Gaps

Although a considerable amount of research has been conducted, there are still gaps: inconsistent results from across different geographic regions; inadequate consideration of dynamic interactions with other factors; lack of recent research on Central Asia with advanced research techniques; & export quality and value added are neglected. The aim of this study is to tackle these gaps by concentrating on Uzbekistan, using primary data and multiple regression analysis.

2.4 Hypotheses

Based on the literature, the following hypotheses were formulated:

H1: Agricultural exports have a significant positive impact on economic growth.

H2: Government support has a significant positive impact on economic growth.

H3: Agricultural productivity has a significant positive impact on economic growth.

3. Methodology

3.1 Research Design

Cross sectional and quantitative research design was used. Structured questionnaire was used to gather primary data with 300 respondents in Uzbekistan. The hypotheses that derived from the export-led growth theory were tested using the deductive approach.

3.2 Data Collection

The questionnaire comprised 24 items measured on a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree), divided into four sections:

- Agricultural exports (6 items)

- Government support (6 items)
- Agricultural productivity (6 items)
- Economic growth (6 items)

The target population included farmers, agricultural exporters, agribusiness professionals, and policy stakeholders. Simple random sampling was used to select 300 respondents. Data collection occurred via physical and online distribution between January and March 2026.

3.3 Variables and Model Specification

- **Dependent variable:** Economic Growth (EG)
- **Independent variables:** Agricultural Exports (AE), Government Support (GS), Agricultural Productivity (AP)

The econometric model was specified as:

$$EG = \beta_0 + \beta_1 AE + \beta_2 GS + \beta_3 AP + \epsilon$$

3.4 Data Analysis

Data were analysed using SPSS. Techniques included descriptive statistics, reliability analysis (Cronbach's Alpha), Pearson correlation, and multiple regression analysis. The significance level was set at $\alpha = 0.05$.

3.5 Reliability, Validity, and Ethics

Cronbach's Alpha assessed internal consistency. Content and construct validity were ensured through literature-based item design. Ethical protocols included informed consent, anonymity, voluntary participation, and the right to withdraw.

4. Results

4.1 Demographic Profile

Characteristic	Category	Frequency	Percent
<i>Gender</i>	Male	203	67.7
	Female	97	32.3
<i>Age</i>	20–30	9	3.0
	31–40	210	70.0
	41–50	48	16.0
	51+	33	11.0
<i>Occupation</i>	Exporter	77	25.7

Annual Methodological Archive Research Review

<http://amresearchreview.com/index.php/Journal/about>

Online ISSN

3007-3197

Print ISSN

3007-3189

<http://amresearchreview.com/index.php/Journal/a>

	Agribusiness Professional	216	72.0
	Government/Policy	7	2.3
<i>Experience</i>	Less than 5 years	16	5.3
	5–10 years	223	74.3
	10–15 years	33	11.0
	More than 15 years	28	9.3

The sample was predominantly male (67.7%), aged 31–40 (70.0%), agribusiness professionals (72.0%), with 5–10 years of experience (74.3%).

4.2 Descriptive Statistics

<i>Agricultural Exports</i>	300	23.0100	2.37811
<i>Government Support</i>	300	22.9200	2.47940
<i>Agricultural Productivity</i>	300	22.9867	2.39002
<i>Economic Growth</i>	300	23.1867	2.41757

Mean scores were high (≈ 23 out of 30), indicating overall agreement that these factors contribute positively to economic growth.

4.3 Reliability Analysis

Cronbach's Alpha for the 24-item scale was **0.914**, indicating excellent internal consistency.

4.4 Correlation Analysis

Variable	AE	GS	AP	EG
<i>Agricultural Exports (AE)</i>	1			
<i>Government Support (GS)</i>	.607**	1		
<i>Agricultural Productivity (AP)</i>	.617**	.708**	1	
<i>Economic Growth (EG)</i>	.874**	.644**	.641**	1

$p < 0.01$ (2-tailed)

All correlations were positive and statistically significant. Agricultural exports had the strongest correlation with economic growth ($r = 0.874$).

4.5 Regression Analysis

Model Summary

R	R Square	Adjusted R Square	Std. Error of Estimate
.888	.788	.786	1.11815

ANOVA

Source	Sum of Squares	df	Mean Square	F	Sig.
Regression	1377.472	3	459.157	367.251	.000
Residual	370.075	296	1.250		
Total	1747.547	299			

Coefficients

Variable	B	Std. Error	Beta (β)	t	Sig.
(Constant)	.851	.710		1.199	.231
Agricultural Exports	.749	.036	.737	20.643	.000
Government Support	.127	.039	.130	3.277	.001
Agricultural Productivity	.095	.041	.094	2.339	.020

All three hypotheses were accepted. Agricultural exports had the strongest effect ($\beta = 0.737$, $p < 0.001$), followed by government support ($\beta = 0.130$, $p = 0.001$) and agricultural productivity ($\beta = 0.094$, $p = 0.020$).

The estimated regression equation is:

$$EG = 0.851 + 0.749AE + 0.127GS + 0.095AP$$

5. Discussion

The findings are very supportive of export-led growth hypothesis in the agricultural sector in Uzbekistan. This finding is consistent with that of Balassa (1978), Feder (1983) and recent studies like Thommandru et al. (2023) and Murugesan (2019) which indicate that agricultural exports have the highest positive value of β . This is a confirmation that the agricultural export activities create foreign exchange, boost domestic production and enhance resource allocation.

Furthermore, the support from the government also had a positive effect on economic growth ($\beta = 0.130$) in accordance with Krueger (2000) and empirical study conducted by Songling et al. (2018) and Saberi and Hamdan (2019). This highlights

the need for subsidies, infrastructure, training and trade facilitation policies.

The effect of agricultural productivity was smaller ($\beta = 0.094$), but still statistically significant. This indicates that the benefits of economic growth from the increase in productivity need to be accompanied by the export orientation and support policies to fully realize these gains. This finding is similar to the endogenous growth theory Grossman and Helpman (1993) and the recent findings of Maiga (2024) and Güzel and Akin (2021).

The high R^2 (0.788) value signifies that the three independent variables account for almost 79% of the variation in economic growth perceptions, whereas the remaining 21% of the variation is explained by other factors like foreign direct investment, inflation or global market conditions. The model is statistically significant ($F = 367.251$, $p < 0.001$), which indicates that the model is robust.

These results have important policy implications. Policymakers should focus on the promotion of agricultural exports, such as market access and trade agreements, and value-added products. Secondly, government support should be enhanced by targeted subsidies, rural infrastructure and export facilitation. Thirdly, agricultural productivity should be improved using modern technology, quality inputs and farmer training programs.

The limitations of the study are that it may only be able to be used in a cross-sectional fashion using perception-based data, which makes it difficult to make causal inferences. Further studies should utilize time-series or panel data, expand macroeconomic data, and compare the experience of Central Asian countries.

6. Conclusions

The aims of the study were accomplished successfully. The econometric analysis showed that agricultural exports, agricultural support and agricultural productivity is all positively and statistically significant with economic growth in Uzbekistan. The primary driver is agricultural exports with government support and agricultural productivity being the next. The model explained 78.8% of the variance in economic growth and was highly significant.

The results were in line with the export-led growth theory and were useful for policy makers. Improved performance of agriculture exports, better agricultural

support mechanisms by the government, and investments in technologies that increase agricultural productivity will positively impact the sustainable economic growth of developing countries like Uzbekistan.

References

- Adelakun, O. J., Ojo, O. O., & Mpungose, S. (2025). Empirical re-investigation into the export-led growth hypothesis (ELGH): Evidence from EAC and SADC economies. *Economies*, 13(6), 175.
- Armeanu, D. Ş., Vintilă, G., & Gherghina, Ş. C. (2017). Empirical study towards the drivers of sustainable economic growth in EU-28 countries. *Sustainability*, 10(1), 4.
- Bakari, S., & Mabrouki, M. (2017). The effect of agricultural exports on economic growth in South-Eastern Europe: An empirical investigation using panel data. *Journal of Smart Economic Growth*, 2(4), 49-64.
- Bakari, S., & Tiba, S. (2022). Agricultural exports, agricultural imports and economic growth in China. *Journal of Smart Economic Growth*, 7(3), 35-61.
- Balassa, B. J. J. o. d. E. (1978). Exports and economic growth: further evidence. 5(2), 181-189.
- El Weriemmi, M., & Bakari, S. (2024). The impact of agricultural exports on economic growth: New evidence from low income countries.
- Feder, G. J. J. o. d. e. (1983). On exports and economic growth. 12(1-2), 59-73.
- Grossman, G. M., & Helpman, E. (1993). *Innovation and growth in the global economy*. MIT press.
- Güzel, A. E., & Akin, C. S. (2021). The role of agricultural productivity in economic growth in middle-income countries: An empirical investigation. *Economic Journal of Emerging Markets*, 13-26.
- Krueger, A. O. (2000). *Trade policies and developing nations*. Bloomsbury Publishing USA.
- Mahmood, K., & Munir, S. (2018). Agricultural exports and economic growth in Pakistan: an econometric reassessment. *Quality & Quantity*, 52(4), 1561-1574.
- Maiga, Y. (2024). The impact of agricultural productivity on economic growth in Africa. *Journal of Agricultural Studies*, 12.

- Murugesan, B. (2019). An empirical analysis of agricultural exports on economic growth in India. *Economic Affairs*, 64(3), 481-486.
- Osabohien, R., Akinpelumi, D., Matthew, O., Okafor, V., Iku, E., Olawande, T., & Okorie, U. (2019). Agricultural exports and economic growth in Nigeria: An econometric analysis. IOP Conference Series: Earth and Environmental Science,
- Oyetade, O. O., & Adeyeye, O. (2021). Impact of agricultural output on economic growth in Nigeria: Application of numerical prediction and econometric analysis. *Turkish Journal of Computer and Mathematics Education*, 12(12), 1793-1801.
- Ridzuan, N. H. A. M., Marwan, N. F., Khalid, N., Ali, M. H., & Tseng, M.-L. (2020). Effects of agriculture, renewable energy, and economic growth on carbon dioxide emissions: Evidence of the environmental Kuznets curve. *Resources, Conservation and Recycling*, 160, 104879.
- Romer, P. M. J. J. o. p. E. (1990). Endogenous technological change. *98*(5, Part 2), S71-S102.
- Saberi, M., & Hamdan, A. (2019). The moderating role of governmental support in the relationship between entrepreneurship and economic growth: A study on the GCC countries. *Journal of Entrepreneurship in Emerging Economies*, 11(2), 200-216.
- Solow, R. M. J. T. q. j. o. e. (1956). A contribution to the theory of economic growth. *70*(1), 65-94.
- Songling, Y., Ishtiaq, M., Anwar, M., & Ahmed, H. (2018). The role of government support in sustainable competitive position and firm performance. *Sustainability*, 10(10), 3495.
- Stern, D. I. (2019). Energy and economic growth. In *Routledge handbook of Energy economics* (pp. 28-46). Routledge.
- Thommandru, A., Espinoza-Maguiña, M., Ramirez-Asis, E., Ray, S., Naved, M., & Guzman-Avalos, M. (2023). Role of tourism and hospitality business in economic development. *Materials Today: Proceedings*, 80, 2901-2904.

Annual Methodological Archive Research Review

<http://amresearchreview.com/index.php/Journal/about>

Online ISSN

3007-3197

Print ISSN

3007-3189

<http://amresearchreview.com/index.php/Journal/a>